

## **RAW SEQUENCE LISTING**

**The Biotechnology Systems Branch of the Scientific and Technical  
Information Center (STIC) no errors detected.**

Application Serial Number: 10/018,418A  
Source: IFW/b  
Date Processed by STIC: 11/15/04

# ***ENTERED***



IFW16

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/018,418A

DATE: 11/15/2004

TIME: 11:56:52

Input Set : A:\72715Supplemental.txt

Output Set: N:\CRF4\11152004\J018418A.raw

3 <110> APPLICANT: Morrell, Matthew  
 4 Li, Zhongyi  
 5 Rahman, Sadequr  
 6 Appels, Rudolph  
 8 <120> TITLE OF INVENTION: GENES ENCODING WHEAT STARCH SYNTHASES AND USES THEREFOR  
 10 <130> FILE REFERENCE: 72715Supplemental  
 12 <140> CURRENT APPLICATION NUMBER: 10/018,418A  
 13 <141> CURRENT FILING DATE: 2002-05-09  
 15 <160> NUMBER OF SEQ ID NOS: 59  
 17 <170> SOFTWARE: PatentIn version 3.1  
 19 <210> SEQ ID NO: 1  
 20 <211> LENGTH: 2939  
 21 <212> TYPE: DNA  
 22 <213> ORGANISM: Triticum aestivum  
 24 <220> FEATURE:  
 25 <221> NAME/KEY: CDS  
 26 <222> LOCATION: (176)..(2569)  
 27 <223> OTHER INFORMATION:  
 W--> 30 <400> 1  
 31 atttcctcgg cctgaccccg tgcgtttacc ccacacagag cacactccag tccagtccag 60  
 33 cccactgccg cgctactccc cactcccact gccaccacct ccgcctgcgc cgcgctctgg 120  
 35 gcggaccaac ccgcgcacgc tatcacgac acccaccgcc atcccgccgc ccgcc atg 178  
 36 Met  
 37 1  
 39 tcg tcg gcg gtc gcg tcc gcc gcg tcc ttc ctc gcg ctc gcg tcc gcc 226  
 40 Ser Ser Ala Val Ala Ser Ala Ala Ser Phe Leu Ala Leu Ala Ser Ala  
 41 5 10 15  
 43 tcc ccc ggg aga tca cgg agg agg acg agg gtg agc gcg tcg cca ccc 274  
 44 Ser Pro Gly Arg Ser Arg Arg Arg Thr Arg Val Ser Ala Ser Pro Pro  
 45 20 25 30  
 47 cac acc ggg gct ggc agg ttg cac tgg ccg ccg tcg ccg ccg cag cgc 322  
 48 His Thr Gly Ala Gly Arg Leu His Trp Pro Pro Ser Pro Pro Gln Arg  
 49 35 40 45  
 51 acg gct cgc gac gga gcg gtg gcc gcg cgc gcc gcc ggg aag aag gac 370  
 52 Thr Ala Arg Asp Gly Ala Val Ala Ala Arg Ala Ala Gly Lys Lys Asp  
 53 50 55 60 65  
 55 gcg ggg atc gac gac gcc gcg ccc gcg agg cag ccc cgc gca ctc cgc 418  
 56 Ala Gly Ile Asp Asp Ala Ala Pro Ala Arg Gln Pro Arg Ala Leu Arg  
 57 70 75 80  
 59 ggt ggc gcc gcc acc aag gtt gcg gag cgg agg gat ccc gtc aag acg 466  
 60 Gly Gly Ala Ala Thr Lys Val Ala Glu Arg Arg Asp Pro Val Lys Thr  
 61 85 90 95  
 63 ctc gat cgc gac gcc gcg gaa ggt ggc gcg ccg tcc ccg ccg gca ccg 514

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/018,418A

DATE: 11/15/2004

TIME: 11:56:52

Input Set : A:\72715Supplemental.txt

Output Set: N:\CRF4\11152004\J018418A.raw

64	Leu	Asp	Arg	Asp	Ala	Ala	Glu	Gly	Gly	Ala	Pro	Ser	Pro	Pro	Ala	Pro	
65			100					105					110				
67	agg	cag	gag	gac	gcc	cgt	ctg	ccg	agc	atg	aac	ggc	atg	ccg	gtg	aac	562
68	Arg	Gln	Glu	Asp	Ala	Arg	Leu	Pro	Ser	Met	Asn	Gly	Met	Pro	Val	Asn	
69		115					120					125					
71	ggt	gaa	aac	aaa	tct	acc	ggc	ggc	ggc	ggc	gcg	act	aaa	gac	agc	ggg	610
72	Gly	Glu	Asn	Lys	Ser	Thr	Gly	Gly	Gly	Gly	Ala	Thr	Lys	Asp	Ser	Gly	
73	130					135					140					145	
75	ctg	ccc	gca	ccc	gca	cgc	gcg	ccc	cag	ccg	tcg	agc	cag	aac	aga	gta	658
76	Leu	Pro	Ala	Pro	Ala	Arg	Ala	Pro	Gln	Pro	Ser	Ser	Gln	Asn	Arg	Val	
77					150					155						160	
79	ccg	gtg	aat	ggt	gaa	aac	aaa	gct	aac	gtc	gcc	tcg	ccg	ccg	acg	agc	706
80	Pro	Val	Asn	Gly	Glu	Asn	Lys	Ala	Asn	Val	Ala	Ser	Pro	Pro	Thr	Ser	
81			165						170						175		
83	ata	gcc	gag	gtc	gcg	gct	ccg	gat	ccc	gca	gct	acc	att	tcc	atc	agt	754
84	Ile	Ala	Glu	Val	Ala	Ala	Pro	Asp	Pro	Ala	Ala	Thr	Ile	Ser	Ile	Ser	
85		180					185						190				
87	gac	aag	gcg	cca	gag	tcc	gtt	gtc	cca	gcc	gag	aag	gcg	ccg	ccg	tcg	802
88	Asp	Lys	Ala	Pro	Glu	Ser	Val	Val	Pro	Ala	Glu	Lys	Ala	Pro	Pro	Ser	
89		195					200					205					
91	tcc	ggc	tca	aat	ttc	gtg	ccc	tcg	gct	tct	gct	ccc	ggg	tct	gac	act	850
92	Ser	Gly	Ser	Asn	Phe	Val	Pro	Ser	Ala	Ser	Ala	Pro	Gly	Ser	Asp	Thr	
93	210				215						220					225	
95	gtc	agc	gac	gtg	gaa	ctt	gaa	ctg	aag	aag	ggg	gcg	gtc	att	gtc	aaa	898
96	Val	Ser	Asp	Val	Glu	Leu	Glu	Leu	Lys	Lys	Gly	Ala	Val	Ile	Val	Lys	
97			230						235						240		
99	gaa	gct	cca	aac	cca	aag	gct	ctt	tcg	ccg	ccc	gca	gca	ccc	gct	gta	946
100	Glu	Ala	Pro	Asn	Pro	Lys	Ala	Leu	Ser	Pro	Pro	Ala	Ala	Pro	Ala	Val	
101			245						250						255		
103	caa	caa	gac	ctt	tgg	gac	ttc	aag	aaa	tac	att	ggt	ttc	gag	gag	ccc	994
104	Gln	Gln	Asp	Leu	Trp	Asp	Phe	Lys	Lys	Tyr	Ile	Gly	Phe	Glu	Glu	Pro	
105			260						265						270		
107	gtg	gag	gcc	aag	gat	gat	ggc	cgg	gct	gtt	gca	gat	gat	gcg	ggc	tcc	1042
108	Val	Glu	Ala	Lys	Asp	Asp	Gly	Arg	Ala	Val	Ala	Asp	Asp	Ala	Gly	Ser	
109		275					280						285				
111	ttc	gaa	cac	cac	cag	aat	cac	gat	tcc	ggg	cct	ttg	gca	ggg	gag	aac	1090
112	Phe	Glu	His	His	Gln	Asn	His	Asp	Ser	Gly	Pro	Leu	Ala	Gly	Glu	Asn	
113	290					295				300						305	
115	gtc	atg	aac	gtg	gtc	gtg	gct	gct	gaa	tgt	tct	ccc	tgg	tgc	aaa		1138
116	Val	Met	Asn	Val	Val	Val	Ala	Ala	Glu	Cys	Ser	Pro	Trp	Cys	Lys		
117				310					315						320		
119	aca	ggt	ggt	ctt	gga	gat	gtt	gcc	ggt	gct	ttg	ccc	aag	gct	ttg	gcg	1186
120	Thr	Gly	Gly	Leu	Gly	Asp	Val	Ala	Gly	Ala	Leu	Pro	Lys	Ala	Leu	Ala	
121			325						330						335		
123	aag	aga	gga	cat	cgt	gtt	atg	gtt	gtg	gta	cca	agg	tat	ggg	gac	tat	1234
124	Lys	Arg	Gly	His	Arg	Val	Met	Val	Val	Val	Pro	Arg	Tyr	Gly	Asp	Tyr	
125			340						345						350		
127	gag	gaa	gcc	tac	gat	gtc	gga	gtc	cga	aaa	tac	tac	aag	gct	gct	gga	1282
128	Glu	Glu	Ala	Tyr	Asp	Val	Gly	Val	Arg	Lys	Tyr	Tyr	Lys	Ala	Ala	Gly	

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/018,418A

DATE: 11/15/2004

TIME: 11:56:52

Input Set : A:\72715Supplemental.txt

Output Set: N:\CRF4\11152004\J018418A.raw

129	355	360	365	
131	cag gat atg gaa gtg aat tat ttc cat gct tat atc gat gga gtt gat			1330
132	Gln Asp Met Glu Val Asn Tyr Phe His Ala Tyr Ile Asp Gly Val Asp			
133	370	375	380	385
135	ttt gtg ttc att gac gct cct ctc ttc cga cac cgc cag gaa gac att			1378
136	Phe Val Phe Ile Asp Ala Pro Leu Phe Arg His Arg Gln Glu Asp Ile			
137	390	395	400	
139	tat ggg ggc agc aga cag gaa att atg aag cgc atg att ttg ttc tgc			1426
140	Tyr Gly Gly Ser Arg Gln Glu Ile Met Lys Arg Met Ile Leu Phe Cys			
141	405	410	415	
143	aag gcc gct gtc gag gtt cca tgg cac gtt cca tgc ggc ggt gtc cct			1474
144	Lys Ala Ala Val Glu Val Pro Trp His Val Pro Cys Gly Gly Val Pro			
145	420	425	430	
147	tat ggg gat gga aat ctg gtg ttt att gca aat gat tgg cac acg gca			1522
148	Tyr Gly Asp Gly Asn Leu Val Phe Ile Ala Asn Asp Trp His Thr Ala			
149	435	440	445	
151	ctc ctg cct gtc tat ctg aaa gca tat tac agg gac cat ggt ttg atg			1570
152	Leu Leu Pro Val Tyr Leu Lys Ala Tyr Tyr Arg Asp His Gly Leu Met			
153	450	455	460	465
155	cag tac act cgg tcc att atg gtg ata cat aac atc gct cac cag ggc			1618
156	Gln Tyr Thr Arg Ser Ile Met Val Ile His Asn Ile Ala His Gln Gly			
157	470	475	480	
159	cgt ggc cca gta gat gag ttc ccg ttc acc gag ttg cct gag cac tac			1666
160	Arg Gly Pro Val Asp Glu Phe Pro Phe Thr Glu Leu Pro Glu His Tyr			
161	485	490	495	
163	ctg gaa cac ttc aga ctg tac gac ccc gtg ggt ggt gaa cac gcc aac			1714
164	Leu Glu His Phe Arg Leu Tyr Asp Pro Val Gly Gly Glu His Ala Asn			
165	500	505	510	
167	tac ttc gcc gcc ggc ctg aag atg gcg gac cag gtt gtc gtc gtg agc			1762
168	Tyr Phe Ala Ala Gly Leu Lys Met Ala Asp Gln Val Val Val Val Ser			
169	515	520	525	
171	ccg ggg tac ctg tgg gag ctg aag acg gtg gag ggc ggc tgg ggg ctt			1810
172	Pro Gly Tyr Leu Trp Glu Leu Lys Thr Val Glu Gly Gly Trp Gly Leu			
173	530	535	540	545
175	cac gac atc ata cgg cag aac gac tgg aag acc cgc ggc atc gtg aac			1858
176	His Asp Ile Ile Arg Gln Asn Asp Trp Lys Thr Arg Gly Ile Val Asn			
177	550	555	560	
179	ggc atc gac aac atg gag tgg aac ccc gag gtg gac gtc cac ctc aag			1906
180	Gly Ile Asp Asn Met Glu Trp Asn Pro Glu Val Asp Val His Leu Lys			
181	565	570	575	
183	tcg gac ggc tac acc aac ttc tcc ctg ggg acg ctg gac tcc ggc aag			1954
184	Ser Asp Gly Tyr Thr Asn Phe Ser Leu Gly Thr Leu Asp Ser Gly Lys			
185	580	585	590	
187	cgg cag tgc aag gag gcc ctg cag cgg gag ctg ggc ctg cag gtc cgc			2002
188	Arg Gln Cys Lys Glu Ala Leu Gln Arg Glu Leu Gly Leu Gln Val Arg			
189	595	600	605	
191	ggc gac gtg ccg ctg ctc ggc ttc atc ggg cgc ctg gac ggg cag aag			2050
192	Gly Asp Val Pro Leu Leu Gly Phe Ile Gly Arg Leu Asp Gly Gln Lys			
193	610	615	620	625

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/018,418A

DATE: 11/15/2004

TIME: 11:56:52

Input Set : A:\72715Supplemental.txt

Output Set: N:\CRF4\11152004\J018418A.raw

```

195 ggc gtg gag atc atc gcg gac gcg atg ccc tgg atc gtg agc cag gac      2098
196 Gly Val Glu Ile Ile Ala Asp Ala Met Pro Trp Ile Val Ser Gln Asp
197              630              635              640
199 gtg cag ctg gtc atg ctg ggc acc ggg cgc cac gac ctg gag ggc atg      2146
200 Val Gln Leu Val Met Leu Gly Thr Gly Arg His Asp Leu Glu Gly Met
201              645              650              655
203 ctg cgg cac ttc gag cgg gag cac cac gac aag gtg cgc ggg tgg gtg      2194
204 Leu Arg His Phe Glu Arg Glu His His Asp Lys Val Arg Gly Trp Val
205              660              665              670
207 ggg ttc tcc gtg cgg ctg gcg cac cgg atc acg gcc ggc gcc gac gcg      2242
208 Gly Phe Ser Val Arg Leu Ala His Arg Ile Thr Ala Gly Ala Asp Ala
209              675              680              685
211 ctc ctc atg ccc tcc cgg ttc gag ccg tgc gga ctg aac cag ctc tac      2290
212 Leu Leu Met Pro Ser Arg Phe Glu Pro Cys Gly Leu Asn Gln Leu Tyr
213 690              695              700              705
215 gcc atg gcc tac ggc acc gtc ccc gtc gtg cat gcc gtc ggt ggc ctg      2338
216 Ala Met Ala Tyr Gly Thr Val Pro Val Val His Ala Val Gly Gly Leu
217              710              715              720
219 agg gac acc gtg ccg ccg ttc gac ccc ttc aac cac tcc ggg ctc ggg      2386
220 Arg Asp Thr Val Pro Pro Phe Asp Pro Phe Asn His Ser Gly Leu Gly
221              725              730              735
223 tgg acg ttc gac cgc gca gag gcg cag aag ctg atc gag gcg ctc ggg      2434
224 Trp Thr Phe Asp Arg Ala Glu Ala Gln Lys Leu Ile Glu Ala Leu Gly
225              740              745              750
227 cac tgc ctc cgc acc tac cgg gac tac aag gag agc tgg agg ggg ctc      2482
228 His Cys Leu Arg Thr Tyr Arg Asp Tyr Lys Glu Ser Trp Arg Gly Leu
229              755              760              765
231 cag gag cgc ggc atg tcg cag gac ttc agc tgg gag cat gcc gcc aag      2530
232 Gln Glu Arg Gly Met Ser Gln Asp Phe Ser Trp Glu His Ala Ala Lys
233 770              775              780              785
235 ctc tac gag gac gtc ctc gtc aag gcc aag tac cag tgg tgaacgctag      2579
236 Leu Tyr Glu Asp Val Leu Val Lys Ala Lys Tyr Gln Trp
237              790              795
239 ctgctagccg gtccagcccc gcatgcgtgc atgacaggat ggaattgcgc attgcgcacg      2639
241 caggaagggtg ccatggagcg ccggcatccg cgaagtacag tgacatgagg tgtgtgtggt      2699
243 tgagacgctg attccgatct ggtccgtagc agagtagagc ggaggtaggg aagcgctcct      2759
245 tgttacaggt atatgggaat gttgttaact tggatttgta atttgttatg ttgtgtgcat      2819
247 tattacagag ggcaacgata tgcgcccgcg caccggccca actgttgggc cggtcgcaca      2879
249 gcagccgttg gatccgaccg cctgggcccgt tggatcccac cgaaaaaaaa aaaaaaaaaa      2939
252 <210> SEQ ID NO: 2
253 <211> LENGTH: 798
254 <212> TYPE: PRT
255 <213> ORGANISM: Triticum aestivum
257 <400> SEQUENCE: 2
259 Met Ser Ser Ala Val Ala Ser Ala Ala Ser Phe Leu Ala Leu Ala Ser
260 1              5              10              15
263 Ala Ser Pro Gly Arg Ser Arg Arg Arg Thr Arg Val Ser Ala Ser Pro
264              20              25              30
267 Pro His Thr Gly Ala Gly Arg Leu His Trp Pro Pro Ser Pro Pro Gln

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/018,418A

DATE: 11/15/2004

TIME: 11:56:52

Input Set : A:\72715Supplemental.txt

Output Set: N:\CRF4\11152004\J018418A.raw

```

268          35          40          45
271 Arg Thr Ala Arg Asp Gly Ala Val Ala Ala Arg Ala Ala Gly Lys Lys
272          50          55          60
275 Asp Ala Gly Ile Asp Asp Ala Ala Pro Ala Arg Gln Pro Arg Ala Leu
276 65          70          75          80
279 Arg Gly Gly Ala Ala Thr Lys Val Ala Glu Arg Arg Asp Pro Val Lys
280          85          90          95
283 Thr Leu Asp Arg Asp Ala Ala Glu Gly Gly Ala Pro Ser Pro Pro Ala
284          100          105          110
287 Pro Arg Gln Glu Asp Ala Arg Leu Pro Ser Met Asn Gly Met Pro Val
288          115          120          125
291 Asn Gly Glu Asn Lys Ser Thr Gly Gly Gly Gly Ala Thr Lys Asp Ser
292          130          135          140
295 Gly Leu Pro Ala Pro Ala Arg Ala Pro Gln Pro Ser Ser Gln Asn Arg
296 145          150          155          160
299 Val Pro Val Asn Gly Glu Asn Lys Ala Asn Val Ala Ser Pro Pro Thr
300          165          170          175
303 Ser Ile Ala Glu Val Ala Ala Pro Asp Pro Ala Ala Thr Ile Ser Ile
304          180          185          190
307 Ser Asp Lys Ala Pro Glu Ser Val Val Pro Ala Glu Lys Ala Pro Pro
308          195          200          205
311 Ser Ser Gly Ser Asn Phe Val Pro Ser Ala Ser Ala Pro Gly Ser Asp
312          210          215          220
315 Thr Val Ser Asp Val Glu Leu Glu Leu Lys Lys Gly Ala Val Ile Val
316 225          230          235          240
319 Lys Glu Ala Pro Asn Pro Lys Ala Leu Ser Pro Pro Ala Ala Pro Ala
320          245          250          255
323 Val Gln Gln Asp Leu Trp Asp Phe Lys Lys Tyr Ile Gly Phe Glu Glu
324          260          265          270
327 Pro Val Glu Ala Lys Asp Asp Gly Arg Ala Val Ala Asp Asp Ala Gly
328          275          280          285
331 Ser Phe Glu His His Gln Asn His Asp Ser Gly Pro Leu Ala Gly Glu
332          290          295          300
335 Asn Val Met Asn Val Val Val Val Ala Ala Glu Cys Ser Pro Trp Cys
336 305          310          315          320
339 Lys Thr Gly Gly Leu Gly Asp Val Ala Gly Ala Leu Pro Lys Ala Leu
340          325          330          335
343 Ala Lys Arg Gly His Arg Val Met Val Val Val Pro Arg Tyr Gly Asp
344          340          345          350
347 Tyr Glu Glu Ala Tyr Asp Val Gly Val Arg Lys Tyr Tyr Lys Ala Ala
348          355          360          365
351 Gly Gln Asp Met Glu Val Asn Tyr Phe His Ala Tyr Ile Asp Gly Val
352          370          375          380
355 Asp Phe Val Phe Ile Asp Ala Pro Leu Phe Arg His Arg Gln Glu Asp
356 385          390          395          400
359 Ile Tyr Gly Gly Ser Arg Gln Glu Ile Met Lys Arg Met Ile Leu Phe
360          405          410          415
363 Cys Lys Ala Ala Val Glu Val Pro Trp His Val Pro Cys Gly Gly Val
364          420          425          430

```

RAW SEQUENCE LISTING ERROR SUMMARY  
PATENT APPLICATION: US/10/018,418A

DATE: 11/15/2004  
TIME: 11:56:53

Input Set : A:\72715Supplemental.txt  
Output Set: N:\CRF4\11152004\J018418A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:9; N Pos. 1520  
Seq#:9; Xaa Pos. 507  
Seq#:10; Xaa Pos. 507  
Seq#:53; Xaa Pos. 13  
Seq#:54; Xaa Pos. 4

## VERIFICATION SUMMARY

PATENT APPLICATION: US/10/018,418A

DATE: 11/15/2004

TIME: 11:56:53

Input Set : A:\72715Supplemental.txt

Output Set: N:\CRF4\11152004\J018418A.raw

L:30 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:1,Line#:27  
L:470 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:3,Line#:467  
L:908 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:5,Line#:905  
L:1242 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:7,Line#:1239  
L:2125 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:9,Line#:2115  
L:2250 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1488  
M:341 Repeated in SeqNo=9  
L:2551 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:496  
L:4183 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:53 after pos.:0  
L:4207 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:54 after pos.:0